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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/681,262	10/09/2003	Victor V. Nekrasov	NEKRASOV2	5994
1444 7590 04/18/2007 BROWDY AND NEIMARK, P.L.L.C. 624 NINTH STREET, NW SUITE 300 WASHINGTON, DC 20001-5303			EXAMINER GAKH, YELENA G	
			ART UNIT 1743	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE			MAIL DATE	DELIVERY MODE
3 MONTHS			04/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/681,262

Applicant(s)

NEKRASOV ET AL.

Examiner

Yelena G. Gakh, Ph.D.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

The examiner respectfully requests the Applicants to provide the most pertinent references, especially those of Nekrasov and Beyermann, 1982, along with the IDS form for consideration by the examiner.

Specification

2. The specification is objected to because of the following informalities: in paragraph [0020] the expression "comparing absorption, *spectral*, luminescent, an Raman characteristics" is technically incorrect, since "absorption", "luminescent" and "Raman" are all "spectral" characteristics, and therefore the word "spectral" should be placed after e.g. "Raman". The same is true for paragraph [0021]. Correction is required.

In paragraph [0032] the specification discloses "intensity values of the luminescent *irradiated* by a sample". The sample cannot "irradiate" luminescent. The sample can be irradiated with a radiation, rather than the opposite. It appears that the expression was meant to be "the luminescent *radiated* by a sample". The same problem occurs through the whole disclosure. Correction is required.

The specification is objected to as being unclear regarding Figures 1 and 2. On page 6, paragraph [0011], the specification refers to the luminescent spectra of trace impurities described in the prior art and points to Figures 1 and 2. Therefore, it is not clear, if Figures 1 and 2 describe the prior art, in which case they should be titled "Prior Art", or they describe spectra of the instant invention.

3. The specification is objected to because it does not “contain a written description of the invention ... in such full, clear, concise, and exact terms as to enable any person skilled in the art ... to make and use the same”.

In general, the specification does not provide a clear and definite disclosure of the claimed method. In particular, the Summary of the Invention states that “an object of the present invention [is] to provide a method for determining the identity of components in multicomponent mixture” (page 9, paragraph [0016]). The examiner failed to find a description of such method in the specification. It appears that the disclosed method allows comparing optical spectral signature of a sample comprising a mixture of compounds with that of the reference mixture, which may indicate changes in the mixture composition. However, it is not clear, how this comparison allows identifying all components of the mixture.

On page 12, paragraph [0025], the description of devices “for extracting the monochromatic probing irradiation” and “extracting the luminescence wavelengths” (what is this?) is not clear. It is not apparent, as to what type of devices these might be and how they operate to “extract” the monochromatic irradiation from the broadband radiation or luminescence wavelengths. Are they very selective filters? Are they something else? The examiner did not find any examples of such devices in the specification. It is further unapparent, as to what “a device of focusing the probing ray” might be, and where the focusing takes place.

On page 14 in paragraph [0028] the specification discloses, “sections of monochromatic light within a spectral width of $\Delta\lambda_i$ are extracted from this light in the selected range of wavelengths λ_i ”. It is not clear, how the monochromatic light can have a spectral width of $\Delta\lambda_i$, when by a definition the monochromatic light has a specific wavelength. It is further totally unclear as to what the following expression might mean: “the extracted monochromatic light is then focused *onto* a probing beam having a specific geometric shape”. How is it possible to focus the monochromatic light *onto* the probing beam? Are there two light beams, one of which is focused onto another? How can it be done? Should the expression be “the extracted monochromatic light is then focused *into* the probing beam having a specific geometric shape”? If this is the case, it is still not apparent, as to what the specific geometric shape of the probing beam is.

It is unclear, whether a sample of a known mixture K and a sample of an unknown mixture U are anyhow related; if they are not related, it is not clear, which conclusions can be drawn regarding the sample of the unknown mixture U upon comparison of their spectra?

On page 14 it is further disclosed that the luminescent light from the sample is “decomposed” “into a variety of spectral sections” with a sequential “extraction” of the specified sections of wavelengths with the predetermined characteristic wavelength. It is not clear, how this is practically done, and which devices are used for performing these method steps.

On page 18 in paragraph [0036] the specification discloses “a specially made-up mixture or multi-component solutions of a strictly identical constant compound”. The examiner is at loss, as to what this expression might mean. Does it mean that the calibration samples comprise mixtures of identical compounds in different proportions? The same phrase is used in paragraph [0051]. The expression is totally unclear.

On page 19 the specification discloses “intensity values of the luminescent light irradiated by a sample”. The luminescent light cannot be “irradiated” by the sample. It can be “radiated” by the sample. Corresponding correction is required.

On page 21 in paragraph [0046] the phrase “a monochromatic *line* of a narrowband (lined) source” is not apparent. Is it a monochromatic light? Also, how can a narrowband source provide a monochromatic light? To the examiner awareness, the monochromatic light is provided either by the light source of the monochromatic light such as a laser, or by a narrow-band source equipped with a monochromator.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1 recites “a method for assaying multi-component mixtures”. The expression “assaying multi-component mixtures” means quantitatively and qualitatively defining all components of multi-component mixtures. The examiner failed to find the disclosure of the method, which allows assaying multi-component mixtures. The method disclosed in the specification allows comparing unknown mixtures with the known mixtures through their optical characteristics and drawing conclusions on identity or differences of the unknown mixture with the known mixtures. The specification does not disclose the method, which would allow identification of all components of the unknown mixtures by performing the steps recited in the claims. The examiner suggests changing the preamble of claims 1 and 2 to e.g. “a method of determining a compliance of a liquid sample comprising an unknown multi-component mixture with a standard comprising a known multi-component mixture, comprising:”.

Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention

Claim 1 further recites “introducing light from a wideband source of optical radiation and dividing the light into spectral components, and/or extracting the assigned sections of monochromatic light with a spectral width of $\Delta\lambda_i$ ”. The specification does not contain a detailed disclosure of how the steps of “dividing the light into spectral components, and/or extracting the assigned sections of monochromatic light”, which are essential part of the claimed method, are performed. The specification further does not provide a detailed description of either “focusing the extracted monochromatic light onto a probing having a specific geometric shape”, or the “specific geometric shape” of the probing beam. Also, the specification does not provide a detailed description of a decomposition of the luminescent light radiated by the sample into a variety of spectral sections and a sequential extraction of the specified sections, recited in step e.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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7. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites in step a. “introducing light”. It is not clear, where the light is introduced? Is it supposed to be “generating light by a wideband source”? Further, it is not apparent, as to how the light is divided into spectral components, and which spectral components are meant in the claim? Are these spectral bands? It is not apparent, as to what is meant by the expression “the light is extracted”. How can the light be “extracted”? Does it mean that the light of a certain wavelength range is selected? It is further unclear as to what does it mean, that the extracted monochromatic light is focused “onto a probing beam having a specific geometric shape”? How can the light be focused *onto* the beam, and what is the specific geometry of the probing beam? It is further unclear in step f., what are “the intensity values of the luminescence irradiated by a sample”? The luminescence cannot be irradiated by the sample. Rather the sample can be *irradiated* by a source of radiation, while the sample can *radiate* luminescence.

In step g. it is not clear, what the expression “comparing the corresponding relative intensity values of the light passing through a sample, or reflected by a sample, *on* each of extracted wave-lengths λ_m ” might be. Should “on” be changed to “at”?

The step h. is not apparent. What does it mean: “defining the presence or absence of foreign impurities in the mixture by the following expressions ... at the same time, if ..., foreign impurities in the sample being identified are absent, and the conclusion about the presence of unwanted contaminations in the mixture under study may be drawn when there are sections ... in the difference spectra”? How can the presence or absence of foreign impurities in the mixture be determined by a certain expression “at the same time”? What action is performed “at the same time”? Calculation of the expression? Regarding the remaining language of the step, the examiner suggests changing the language to the following: after “by the following expressions: ...” rewrite the phrase as “wherein, if $C_T(\lambda) = C_L(\lambda) = 0 \pm \delta$, the foreign impurities in the sample are determined absent, while if $C_T(\lambda) > 0 \pm \delta$, and/or $C_L(\lambda) \neq 0 \pm \delta$ the foreign impurities in the sample are determined present”.

In claim 2 step c. is unclear, as it is not apparent as to what “a specially made-up mixture or multi-component solution of a strictly identical constant compound” might be. How can a

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mixture or a multi-component solution comprise “a strictly identical constant compound”? If there is just one compound in this solution, it cannot be a mixture or a multi-component solution. Moreover, it is not clear, as to what does the definition “strictly identical constant compound” mean? What is a “constant compound”? And what is it identical to?

At the end of step h. the term “cells of the matrix” should be replaced with a conventional term “elements of the matrix”.

In step j. the question arises regarding the phrase “at the same time”, since it is not clear, as to what the phrase refers to. For the rest of the step the examiner suggests rewriting the step after the mathematical expression as the following: “wherein, if the matrix $\|C_{ALS}\|$ comprises nonzero elements, the values of which exceed the value of allowable deflection from the corresponding values of the standard sample of the known mixture, $|c_i, c_{i,j}| > |\pm\delta|$, the sample under analysis is defined as containing the unwanted contaminations”.

In claim 3 the limitation “the identified sample” should be replaced with “the sample under analysis” in order to have an antecedent basis.

It is further unclear, which method steps of claim 1 the method steps of claim 3 follow. It is also not clear, how the sample can be irradiated with a monochromatic light at several frequencies.

In step e. the following changes are suggested: after the mathematical expression rewrite the step as: “wherein the unknown mixture and the known mixture are defined as being identical if $A=1\pm\delta$ ”.

In claim 4 it seems that the dependency of the claim is incorrect, since claim 2 does not recite any Raman spectroscopy. If, in fact, claim 4 does depend on claim 2, it should recite steps of acquiring absorption and Raman spectra besides luminescent spectra recited in claim 2.

The problem with the language regarding the calibration sample was described above. Correction is required.

Claim 5 is unclear and indefinite, since it is not apparent, as to which “appropriate solvents” are meant in the claim. Also, the “sample under analysis” should be recited instead of “the sample being identified”.

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Claim 6 should be amended to recite water comprising impurities or contamination, or something similar (e.g. "contaminated water"), since water itself cannot be described as a mixture.

8. Due to a plurality of problems concerning 35 U.S.C. 112, first and second paragraphs, no prior art is applied at this time.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. *Schmidt (SPIE, 1993)* teaches "a novel single beam optical spectrophotometer for fast luminescence-, absorption- and reflection-measurements of turbid materials" (Title).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yelena G. Gakh, Ph.D. whose telephone number is (571) 272-1257. The examiner can normally be reached on 9:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

4/16/07


YELENA GAKH
PRIMARY EXAMINER